

STAFF REPORT

Rice Pesticide Program, Management Practices for the 2005 Rice Season

Rice is planted between mid-April through early May and maintained in flooded fields throughout the summer. Pesticides are used on most fields for insect and weed control. Pesticides are applied directly into standing water in the rice field and can leave the field in tailwater.

The Rice Pesticide Program (RPP) was established in the early 1980's to address water quality concerns attributed to rice pesticides, including fish kills in agricultural drains and taste complaints in the City of Sacramento drinking water supply. In 1990, the Central Valley Regional Water Quality Control Board (hereafter the Board) amended the Basin Plan to prohibit discharge of water containing five rice pesticides (thiobencarb, molinate, malathion, carbofuran and methyl parathion) unless dischargers follow Board-approved management practices.

On 4 January 2005 the CRC submitted a draft annual report¹, which provides a summary of the 2004 Rice Pesticide Program. The CRC prepared a final report on 4 February 2005 titled *Water Quality Programs: Fourth Edition Water Quality Control Plan (Basin Plan) for the Sacramento River and San Joaquin River Basins, Rice Pesticides Program*, which proposes management practices for the 2005 rice season.

This staff report provides an overview of the program and concludes with recommendations that the Board approve the CRC management practices as proposed for the 2005 season, with minor revisions.

Historical Perspective

The Board formalized the Rice Pesticide Program in 1990 by amending the Basin Plan² to include an implementation program for the control of rice field discharges containing molinate, thiobencarb, methyl parathion, carbofuran, and malathion. The Board prohibited discharges of water containing the five pesticides unless dischargers follow Board-approved management practices.

The Board uses the performance goals shown in **Table 1** to evaluate the management practices. The performance goals apply to all waters designated as freshwater habitat. As stated in the Basin Plan, to obtain approval, proposed management practices must be expected to help meet these performance goals. Board approval of management practices is also dependent on compliance of discharges containing thiobencarb with the water

¹ Draft titled: *2004 Rice Pesticide Monitoring Report Annual Report Sacramento River Drainage Basin*.

² 4th Edition of the CVRWQCB Water Quality Control Plan

quality objective³ of 1.0 µg/l in water designated as municipal or domestic supply (i.e. the Sacramento River)⁴. The Board can use its management practices approval process to focus on areas of the Program that need to be strengthened.

Table 1. Performance Goals⁵ for Management Practices

<i>Chemical</i>	<i>Performance Goal µg/l (daily maxima)</i>	<i>Product Name</i>	<i>Activity</i>
Molinate	10.0	Ordram [®]	Herbicide
Thiobencarb	1.5	Abolish [®] (liquid) Bolero [®] (granular)	Herbicide
Malathion	0.1	--	Insecticide
Methyl parathion	0.13	--	Insecticide
Carbofuran	No longer used on rice in California ⁶		

Management practices are presented in detail as part of the CRC report. Most of these practices have been in place for years and have been shown to be effective in reducing discharges. This staff report provides a review of the Program results in 2004 and focuses on issues of concern. The executive summary of the CRC report (**Attachment A**) provides an overview of the Program results.

The Program includes monitoring, compliance and enforcement components. The County Agricultural Commissioners (CACs) implement the Program, including issuance of restricted materials permits for thiobencarb and molinate. Growers submit Notices of Intent (NOI) at least 24 hours prior to application and report Notice of Application (NOA) within 24 hours of application allowing CACs the opportunity to observe applications and to track water holding times and other required management practices.

The core of the program consists of water management practices that require farmers to hold pesticide-laden water on the field until pesticides degrade to a level protective of aquatic life. Water holding times are stipulated in the permits issued by the CACs. Hold times are currently 28 days for molinate, 30 days for granular thiobencarb, 19 days for liquid thiobencarb, 24 days for methyl parathion and 4 days for malathion. Malathion holding times are not enforced through use permits since it is not classified as a restricted material. Shorter holding periods are allowed in closed water management systems, areas with reduced water availability, fields in the San Joaquin Valley and hydrologically isolated fields.

Sacramento Valley rice fields discharge into major agricultural drains flowing into the Sacramento River. The Colusa Basin Drain serves as a major western tributary while Butte Slough drains from the east. The Program historically has sampled several

³ The CA secondary MCL is 1.0 µg/l.

⁴ The Colusa Basin Drain and Butte Slough are not designated as municipal or domestic supply waters.

⁵ These performance goals apply to freshwater habitat and are protective of fisheries.

⁶ Carbofuran was one of the chemicals addressed by the control Program but use of the product on rice was banned by the US Environmental Protection Agency (US EPA) in 1999 with use of existing stock concluding in 2000.

locations over a 10 to 14-week period each year to evaluate compliance with performance goals.

The 2004 CRC monitoring program was funded and administered by the CRC, with sampling conducted by a consultant and primary sample analysis conducted by pesticide registrants.

For the 2004 rice season, the CRC monitored five sites, as shown in **Figure 1** and described in **Table 2**, for ten weeks from April 29 to June 29. The Cities of Sacramento and West Sacramento also monitored for seven weeks, from May 3 until June 7, for thiobencarb and molinate at their drinking water intakes on the Sacramento River. The City of West Sacramento intake is located on the Sacramento River upstream of the American River confluence. The City of Sacramento intake is located on the Sacramento River 0.3 km south of the American River confluence.

Figure 1. Rice Pesticide Program 2004 Monitoring Sites

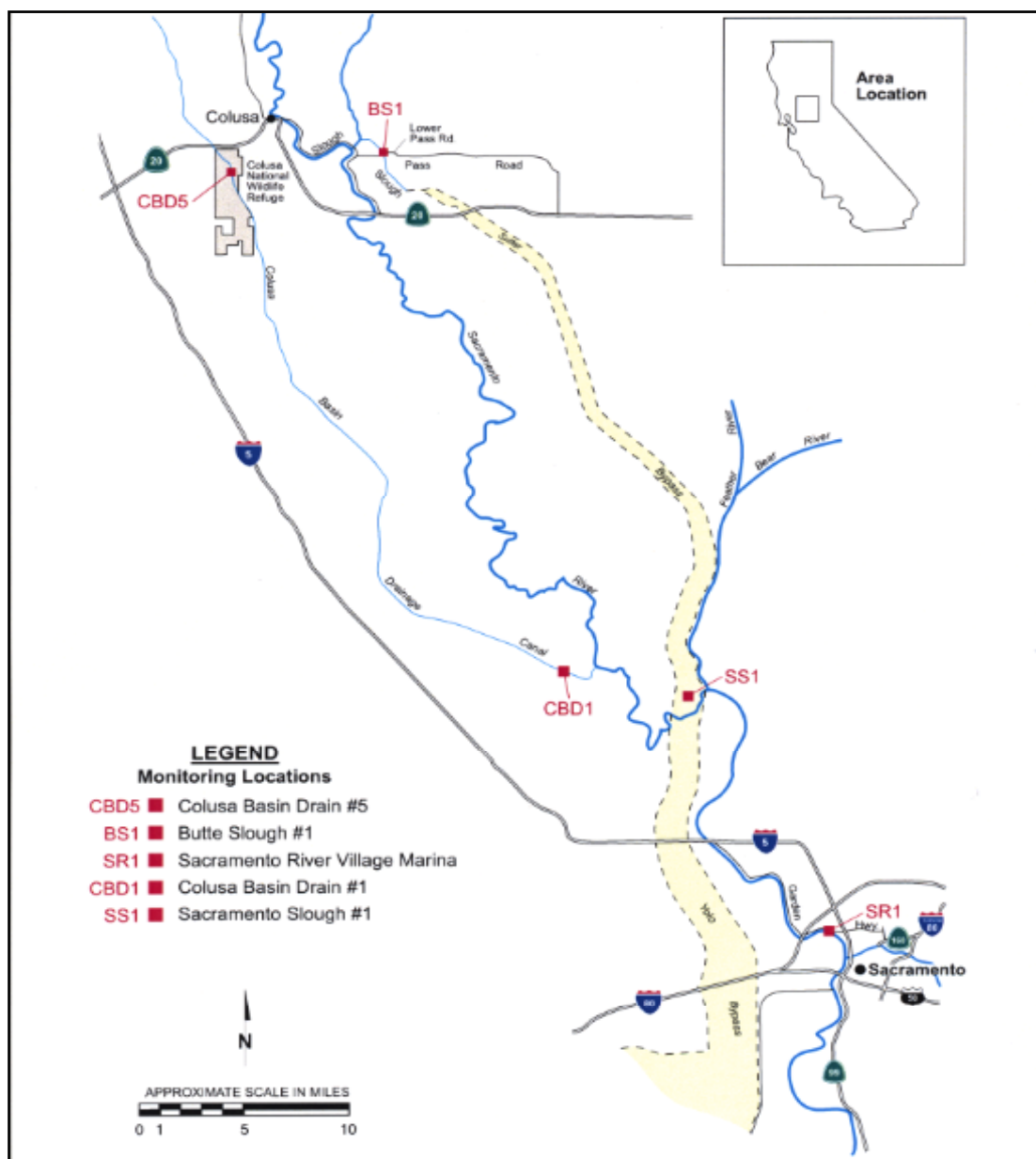


Table 2. RPP Monitoring Sites

Abbreviation	Name	Type
CBD5	Colusa Basin Drain (CBD) at Hwy 20 (Colusa County)	Ag drain
CBD1	CBD at Road 99E (Yolo County)	Ag drain
BS1	Butte Slough at Lower Pass Rd (Sutter County)	Ag drain
SS1	Sacramento Slough at DWR gauging station (Sutter County)	Ag drain
SR1	Sacramento River at Village Marina (Sacramento County)	River
<i>Municipal Intake Sites</i>		
SSR	City of Sacramento Intake, Sacramento River 0.3 km downstream of the American River (Sacramento County)	River
WSR	City of West Sacramento Intake at Bryte Bend (Yolo County)	River

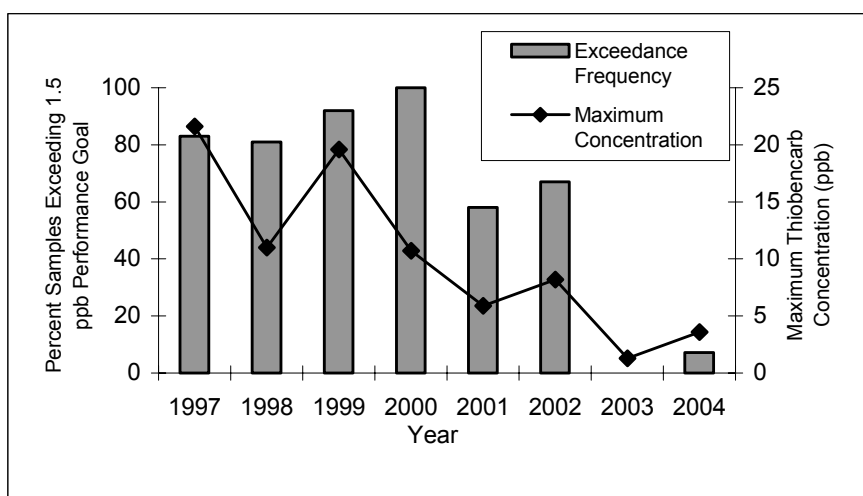
Overall, the Program has proved to be highly successful in reducing the threat to aquatic life posed by rice field discharges. The Program has resulted in significant reductions in rice pesticide concentrations in waterways through the modification of management practices.

Thiobencarb

Thiobencarb is an herbicide used to control annual grasses including watergrass. The frequency of detection above the 1.5- $\mu\text{g/l}$ performance goal and maximum thiobencarb concentrations at CBD5 over the last eight years are shown in **Graph 1**. In 2004, at CBD5 there was one exceedance of the performance goal (at 3.6 $\mu\text{g/l}$) on May 4. Though each rice season varies, typically peak detections occur in mid to late May, corresponding with peak applications of the product. An early May peak detection is atypical, but most likely due to the large number of acres and spread out planting dates that occurred in 2004. The cause of the peak was not explored in the CRC annual report, however in the past DPR has attributed early-season peaks to drift during aerial application of the pesticide.

In addition to the monitoring conducted by the CRC, downstream municipalities also monitor thiobencarb at their drinking water intakes. **Table 3** summarizes the City of Sacramento and the City of West Sacramento's monitoring results. Monitoring at Sacramento's intake generally detects lower thiobencarb concentrations than those observed at West Sacramento's intake, most likely due to the location of the intake being below the addition of the American River, which is essentially free of rice drainage.

Graph 1. Annual exceedances of thiobencarb water quality performance goal and maximum concentrations at CBD5



From 1998 until 2002, City of Sacramento monitoring revealed a general trend of increasing thiobencarb concentrations, as shown in **Table 3**. In 2003 and 2004 thiobencarb levels were much lower, most likely due to the absence of storm discharges and new permit conditions added in an extensive effort to address thiobencarb.

Table 3. Thiobencarb detections at the City of Sacramento (1994-2004) and City of West Sacramento (2001-2004) Intakes

Year	Municipality	Number of Detections ⁷	Peak Concentration (µg/l)
1994 - 1997	Sacramento	0	--
1998	Sacramento	1	0.14
1999	Sacramento	5	0.34
2000	Sacramento	6	0.28
2001	Sacramento	4	0.38
	West Sacramento	4	0.59
2002	Sacramento	8	0.91
	West Sacramento	8	1.60
2003	Sacramento	0	--
	West Sacramento	3	0.16
2004	Sacramento	0	--
	West Sacramento	0	--

Molinate Phase-out

Molinate is an herbicide used to control water grass in rice production. Molinate was one of the primary triggers for the formation of the Rice Pesticide Program after it was identified as a primary cause of fish kills in the early 1980s. Though the Program has been highly successful in reducing molinate in discharges to levels that do not threaten fish, molinate concentrations continue to routinely exceed the Board's performance goal at several monitoring locations. The occurrence of these violations near the time of application points to drift and seepage as likely contributing factors in typical years. Storm-event related discharges might also contribute to molinate peaks in years when storms occur near the time of peak pesticide application, such as the 2002 rice season.

The US EPA periodically reassesses the registration status of pesticides. On 2 April 2003, the US EPA announced availability of a risk assessment for molinate⁸. The risk assessment found that molinate may pose a risk concern to worker safety and mammalian reproduction. The EPA also stated that chronic exposure to molinate may pose a risk to freshwater invertebrates in agricultural drains and small rivers.

On 7 April 2004, the US EPA published a federal register notice⁹ issuing a cancellation order at the request of the pesticide registrants. The cancellation includes a multi-year phase out as follows: In 2005 and 2006, registrants may distribute no more than the 2002 sales level of the molinate active ingredient while 2007 sales may not exceed 75% of this amount. In 2008, registrants may not sell or distribute more than 50% of the 2002 levels. No sales or distribution of molinate products is to occur after June 30, 2008, except for

⁷ Limit of Detection is 0.10 ppb, except 2001: 0.2 µg/l

⁸ US EPA Federal Register 2 April 2002. *Molinate; Availability of Risk Assessment*.

⁹ US EPA Federal Register 7 April 2004. *Molinate; Cancellation Order*.

using up existing stocks. The registrant is required to report sales to the US EPA during the phase out and non-compliance results in immediate cancellation.

Contributing Factors to Continued Detections of Rice Pesticides

In the early years of the Rice Pesticide Program, tailwater was the main source of rice pesticides. As management practices evolved to include longer holding times, drift during aerial applications and seepage emerged as primary contributors of pesticide residues in surface water. Storm events can also play a role in thiobencarb and molinate spikes, as was observed in 2002.

The majority of rice pesticides are applied by air. The Program first officially recognized aerial drift as a problem in 1991¹⁰. By 1994, the Board approved a DPR implementation program to control drift¹¹. Drift prevention requirements now stipulated in the approved management practices include buffer zones, nozzle specifications and limits on wind speeds.

Seepage occurs when water moves laterally off rice fields through levees or borders into an area outside of the field boundaries, after which there is the potential for the pesticide-laden discharge to enter waterways. Starting in 2001, the Program required growers to compact levees to prevent seepage and that the CACs conduct seepage inspections. When the Board approved the Program for the 2002, 2003 and 2004 seasons, the Resolutions¹² requested that seepage inspections continue and asked for a report back on repeat violators and actions taken to address the occurrence.

Weather can also have a significant impact on the performance of the rice pesticide control effort. Warm dry seasons may result in lower pesticide concentrations due to higher degradation rates during the water hold. Wet cold years may see the opposite effect¹³. During large storms, farmers may encounter problems maintaining their water holds. When this happens, farmers may apply to their CAC for an emergency release. Some growers also illegally release treated water as a result of storm events.

CRC Report on the 2004 Season

In the fall of 2002, DPR advised the Regional Board and rice industry that it would change their role in the Program from the primary responsible party to that of a co-regulator with the Regional Board. DPR continues to provide enforcement data and pesticide use data to the CRC for inclusion in the annual report. They also fund and provide guidance to the CACs on management practices including an annual memo outlining the Board approved conditions for the coming season.

¹⁰ CVRWQCB Resolution No.92-041 February 1992

¹¹ CVRWQCB Resolution No. 93-035 February 1993 and Resolution No.94-083 May 1994

¹² CVRWQCB Resolution No.R5-2002-0080 April 2002, CVRWQCB Resolution No.R5-2003-0036 March 2003

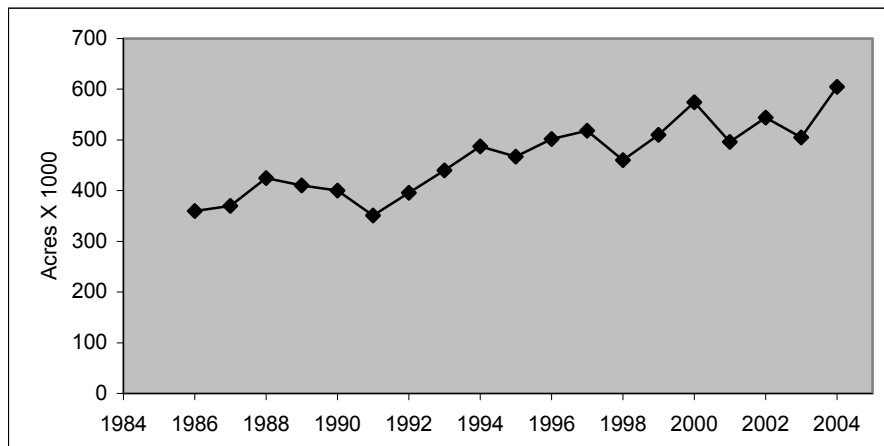
¹³ DPR Information on Rice Pesticides Submitted to the California Regional Water Quality Control Board Central Valley Region 31 December 1996

During the 2003 rice season, the CRC assumed full responsibility for the Program, including monitoring and submittal of the annual report to the Board, including proposing management practices for the next rice season. The CRC's 2004 report includes data that is used to evaluate compliance with the performance goals and to determine if any programmatic changes should be considered.

Trends in Pesticide Use

In 2004, rice acreage in the Sacramento Valley totaled 605,000 acres¹⁴, up 96,000 acres from the previous year. As shown in **Graph 2**, 2004 acreage was the highest seen in the nearly twenty years plotted. Increased acreage was due to medium grain rice production shortages in other parts of the world.

Graph 2. Total Rice Acreage in the Sacramento Valley 1986 – 2004.

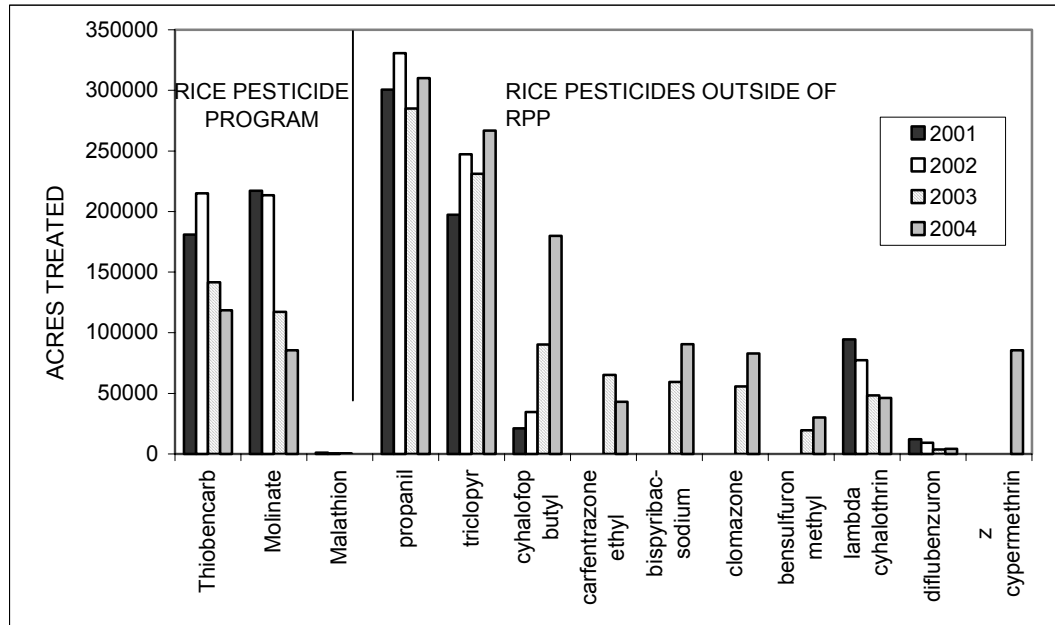


Trends in Pesticide Use - **Graph 3** shows the number of acres treated with thiobencarb, molinate and malathion over the last four years. Thiobencarb and molinate saw a sustained high level of use from 1997 to 2002. In the last two years however, use of both products declined, especially in regards to pounds applied (not shown). Last year (2004) is notable, in that no malathion use was reported on rice in the Sacramento Valley. In comparison, 214 acres were treated in 2003 and 147 acres in 2002. As shown in **Graph 3**, in recent years a number of new rice pesticides have emerged. These new pesticides and other constituents of concern in rice field drainage outside of the five pesticides covered by Rice Pesticides Program are being addressed by a rice-specific Monitoring and Reporting Program issued to the CRC under the Irrigated Lands Waiver¹⁵. Use of new herbicides that control watergrass (such as cyhalofop-butyl, clomazone and bispyribac-sodium) is expected to continue to rise as molinate is phased out over the next three years.

¹⁴ U.S. Dept. of Agriculture National Agricultural Statistics Service

¹⁵ 18 Nov 2004. Central Valley Regional Water Quality Control Board. *Monitoring and Reporting Program Order No. R5-2004-0839 for the California Rice Commission under Resolution No. R5-2003-0105 Conditional Waiver of Waste Discharge Requirements for Discharges from Irrigated Lands.*

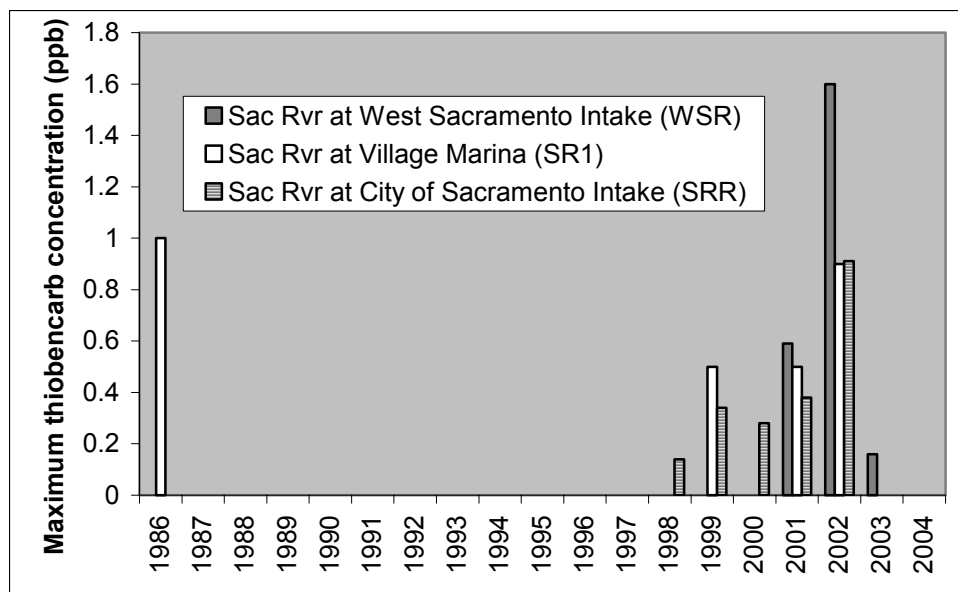
Graph 3. Number of rice acres treated by chemical: 2001-2004.



Monitoring Data

Thiobencarb –Thiobencarb levels monitored in 2004 remained below both the primary MCL of 70 µg/l and the secondary MCL of 1.0 µg/l in the Sacramento River. Violations of the thiobencarb performance goal of 1.5 µg/l, which applies to all waters designated freshwater habitat, did occur on two occasions, May 4th (3.6 µg/l at CBD5) and May 27 (1.6 µg/l at CBD1). Thiobencarb was detected but did not exceed the performance goal at SS1 (peak 0.9 µg/l) and was not detected at all at BS1.

Graph 4. Historical trend of peak thiobencarb concentrations in the Sacramento River from 1982-2004¹⁶



Graph 4 shows the historical trend of peak thiobencarb concentrations detected at monitoring sites on the Sacramento River. In 2004, thiobencarb was not detected in the Sacramento River for the first time since 1997.

Molinate – Molinate levels did not meet or exceed the 10-µg/l-performance goal in 2004 at any of the four drain sites monitored. The detection peak was 4.38 µg/l at SS1 on May 25. The City of West Sacramento recorded a peak concentration of 0.34 µg/l while the City of Sacramento’s peak detection was 0.23 µg/l, much lower than the primary MCL of 20.0 µg/l.

Other Constituents - Methyl parathion, malathion and carbofuran were not sampled during the 2004 rice season due to the absence of use of the products. The Program has also historically included toxicity testing. Toxicity testing for *Ceriodaphnia dubia* was not conducted in 2003 or 2004, due to no toxicity attributable to RPP pesticides in recent years. As agreed upon prior to the 2003 rice season, toxicity testing is now conducted on a triennial basis, with the next round of toxicity testing is scheduled to occur during the 2005-rice season.

Quality Assurance Project Plan (QAPP) – The QAPP currently used by the CRC is the 2002 DPR Rice Pesticide Program Monitoring Protocol Study #206 (March 18 2002) and associated Laboratory Project Plan and Protocol (March 18 2002). Though the procedures currently used are essentially the same as those historically used by DPR, staff sees a need for the CRC to compile their own QAPP documents to specifically reference CRC contacts and to revise the format and content to be more consistent with current Regional

¹⁶ Select data obtained from DPR *Information on Rice Pesticides Submitted to California Regional Water Quality Control Board Central Valley Region* 31 December 1998.

Board QAPP standards. Staff will review the existing QAPP in the coming months and will provide the CRC with comments, with the goal of the CRC developing an updated QAPP for submittal as part of their 2005 annual report and initial use during the 2006 rice season.

Compliance and Enforcement

Emergency Releases – There have been no emergency releases reported for the last two rice seasons. In the past, Agricultural Commissioners allowed emergency releases from fields prior to the end of the standard holding time if necessary to prevent levees from being washed out or crops from being damaged. This was usually related to local thunderstorms adding more water to the field than the grower could handle.

Water Holding Compliance and Application Inspections – The CACs inspected 1,832 fields for water holding requirements. One Agricultural Civil Penalty (ACP) was issued for a waterhold violation in a molinate treated field. CACs also inspected 32 molinate treated fields and 46 thiobencarb treated fields during application¹⁷. There were five molinate ACP's issued for fields inspected during application, including violation of NOI, NOA and drift requirements. The CACs also conducted 29 mix/load inspections for molinate and 32 inspections for thiobencarb, resulting in one thiobencarb ACP attributable to labeling PPE (personal protective equipment).

Seepage – In 2004, CACs observed seepage in four out of 935 fields treated with thiobencarb. In two fields in Butte county seepage was observed at a rate of less than 5 gallons per minute (gpm) while the remaining 2 fields, in Butte and Sutter counties, had seepage greater than 5 gpm seepage. Two ACPs were issued in response to thiobencarb seepage in 2004. In comparison with previous seasons, the percent of thiobencarb sites found to have seepage was much lower in 2004 at 0.4%, as shown in **Table 5**. This is unexpected, as there were 96,000 additional acres of rice planted in 2004 with the potential to release seepage. Thus the expected trend would be to have a higher number of seepage incidents.

Unlike previous years, DPR did not collect the molinate seepage data from the CACs in 2004. From discussions with DPR staff it appears CAC's conducted molinate seepage inspections on fields at the same time as water holding inspections. The lack of molinate data is of concern to Staff, as molinate has greater mobility in the soil than thiobencarb and thus greater potential to leave the field as seepage.

Table 5. Seepage Inspections 2001 – 2004

Year	Total Sites Inspected	Thiobencarb Treated Fields			Molinate Treated Fields		
		Sites Inspected	Sites with Seepage	%	Sites Inspected	Sites with Seepage	%
2001	2129	527	14	2.7	1602	41	2.6
2002	1956	N/A	15	--	N/A	43	--
2003	1973	1,122	29	2.6	851	61	7.2
2004	N/A	935	4	0.4	N/A	N/A	--

¹⁷ CRC compiled data from DPR's Enforcement Action Tracking System Database.

For the 2005 season DPR and the CACs are encouraged to place particular emphasis on seepage inspections and accurate reporting. For the last several years, the Glenn County CAC has conducted pre-application inspections for seepage and if discovered, a restricted use permit was not issued to these growers. Staff encourages the other CACs to consider conducting these types of pre-inspections as a preventive measure. The CACs should continue to check their records of past violators when they discover seepage. As requested for the last two years, we ask that DPR and the CACs notify the Board within 30 days of any repeat seepage incidents so that enforcement may be explored since the Regional Board has the regulatory option of issuance of Cleanup and Abatement Orders to individual dischargers that do not comply with approved management practices.

Additionally, Staff encourages DPR and the CRC to put an emphasis on seepage reporting to make sure that all thiobencarb and molinate inspections are correctly reported. In next years report, the CRC is highly encouraged to discuss each incident of seepage in detail, including the rate of seepage, the amount of seepage, and a detailed account of the action taken to address the seepage. This will likely mean that the CRC will need to contact the individual CACs involved, to gather information above what may be provided by DPR.

Program Issues

There are two issues staff is working on with DPR and CRC to improve the operation of the RPP. The first relates to the transfer of enforcement information from the CACs to the CRC for incorporation into the annual report required by the Regional Board. The second relates to the enforcement of management practices approved by the Board.

The responsibility for preparing the annual report has shifted from DPR to the CRC, but there is not yet a routine process in place for effective transmittal of enforcement data collected by the CACs/DPR to the CRC. During the 2004 season, the CACs conducted and documented seepage inspections and enforcement activities related to the Program but this data was not provided by DPR to the CRC in time for the CRC to submit their report to the Regional Board by the December deadline. Staff has discussed this issue with both DPR and CRC and the proposed resolution asks DPR to provide CRC with the data in time to meet Board deadlines for submittal of the annual report.

Another issue of concern is the transmittal of Board approved permits conditions from DPR to the CACs. When the Board approved conditions for the 2004 season it maintained the conditions as described in a 15 April 2003 letter from DPR to the CACs for the 2003 season. When DPR sent their letter to the CACs with recommended conditions for 2004 however, these conditions were modified. The intent was to make the language easier to understand, but staff has explained that modification of Board-approved conditions may trigger the need for another Board evaluation of the program practices. DPR staff has agreed to carefully review the language in the proposed resolution to ensure that they do not have to modify the language that is considered by the Board.

Discussion

In 2004, the Board approved management practices based on 2003 conditions aimed at halting escalating thiobencarb levels and to prevent future water quality objective exceedances. During the 2004 season, the CRC complied with the conditions including submittal of a Communication Plan from the Storm Event Work Group on 4 March 2004. As no storm events occurred in 2004 there was no need to monitor storm discharges or develop a response plan. The CRC also held their Mandatory Bolero/Abolish Stewardship meetings on 26 February 2004. The CRC continued to monitor for molinate and thiobencarb in ag drains and in the Sacramento River as in 2003.

When the CRC took over responsibility for the Program in 2003, they revived the Rice Working Group to help build consensus on management practices recommendations for the next rice season. CRC has convened a subset of this group with representation by the Regional Board, DPR, University of California Cooperative Extension (UCCE), CACs and the Industry. The group met on 20 January 2005 to discuss the annual report and to formulate group Program recommendations for the 2005 season. The CRC also provided representatives of the Cities with the draft recommendations in January to solicit input. The recommendations uphold the 2004 conditions with small revisions and are provided in the CRC annual report (see **Attachment B**).

As to what lies ahead for the 2005 season, many factors influence a given rice season's monitoring results. As seen in 2002, a major storm during peak application may be all it takes for levels to shoot up. In other years, the total amount of rice grown (and thus pesticides used) may be a primary factor. In discussions with Rice Commission staff, they anticipate less rice acreage in 2005, due to a large carryover of rice from 2004 and water transfers to Cities.

Following the water quality objective exceedances in 2002, the Board reconsidered the Program and adopted several new conditions aimed at addressing reoccurrence of the violation. Most of the Board's conditions, though in place, have not been tested as to their adequacy when conditions are not so favorable. This may occur only when we get another big storm coinciding at the time of greatest pesticide application or when rice acreage is up and thiobencarb use window is available to growers. Based on 2004 results, there is nothing to suggest that continuation of the current conditions cannot accomplish a meaningful measure of protection against future water quality objective exceedances.

Recommendations

The Board may decide one of several alternative actions: no action, which would retain a conditional prohibition of discharges containing the five rice pesticides for the 2005 season; approval of program with the CRC's proposed conditions with slight modifications, which would entail a program very similar to that of the 2003 and 2004 seasons; or approval subject to new or additional conditions.

The CRC provided a draft staff report to Staff and other parties in early January. On 20 January, Regional Board, DPR, UCCE and CAC representatives met with the CRC and agreed upon proposed management practices that uphold the 2004 conditions with slight modifications for the 2005 rice season. In an effort to receive additional input from key stakeholders, in January the CRC also shared their draft report and recommendations with the Cities of Sacramento and West Sacramento. Recommendations were submitted to the Regional Board on 27 January 2004 (**Attachment B**). Staff recommends approval of the program for the 2005 season with the conditions as proposed by the CRC, with minor modifications based on discussions between DPR, the CRC and Staff. These changes update conditions so that wording is consistent with DPR's proposed language to CACs for 2005 such as: 1) Modifying the CRC's Condition III into two separate conditions and specifying that there must be continuous positive airflow in an effort to avoid aerial applications during inversion conditions, 2) Removal of language specifically allowing ground applications near the Rivers as this is already allowed elsewhere, 3) Minor modification in the wording of several conditions to reflect DPR's proposed language for 2005 without changing the intent of the conditions.

February 2005
AES/RJS

Attachment A: Executive Summary of CRC Staff Report
Attachment B: Excerpt of CRC Staff Report: 2005 Recommendations